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This invention relates to a device for spraying water on lawns and other areas covered by vegetation, and more particularly relates to apparatus which combines this function with that of simultaneously dispersing chemicals, weed killers or fertilizers of the water soluble type upon such areas.

A general object of this invention is to provide a unit including a chemical storage reservoir which facilitates storing and generally dissolving therein the chemical to be dispersed and removal of the solute created thereby through aspirator action for admixture with a heavier flow of water by way of which it is ultimately disseminated over a circular pattern in diminishing concentration.

Another object of this invention is to provide a chemical dispersing device which is of simple and rugged construction and which will not be subject to corrosion or plugging after prolonged use.

A further object is to provide a device of the aforementioned type which is easy to operate and maintain by virtue of the absence of any moving parts.

Another specific feature of this invention resides in its ability to be adjusted for producing a spray pattern of greater or lesser radius and for controlling the rate at which the chemical solution is consumed and dispersed.

Other specific objects will appear from time to time throughout the course of the forthcoming detailed description.

In the accompanying drawings whereby a preferred embodiment of the invention is illustrated:

Fig. 1 is a top view of the assembled chemical dispenser forming the subject of this invention;

Fig. 2 is a sectional elevational view of the dispenser taken in the plane of Fig. 1 and 2 of Fig. 1; and,

Fig. 3 is a plan view, in section, taken on line 3—3 of Fig. 2 showing in greater detail the scroll chamber in which the chemical solute is admixed with the principal water flow.

Like elements are designated by like reference characters throughout the several views.

In its broadest aspect the invention includes a reservoir into which any miscible granular or liquid chemical may be deposited, the term chemical being here understood to include fertilizing compounds, weed killers and so forth whether of organic or inorganic nature.

Water under pressure is admitted from any source such as a garden hose to a mixing chamber defined by a cover element which is detachably mounted on and seals a reservoir. This mixing chamber has leading from it an outlet orifice and a tubular member that communicates with the reservoir for the purpose of educting the solute and admixing the same with the main flow of water as it passes from the orifice for dispersal over a wide pattern. An additional jet is provided which supplies water from the inlet to the reservoir for the purpose of agitating its contents and supplementing the liquid solute removed through aspiration.

Referring to Fig. 1, for a more detailed explanation of the invention, it will be noted that the device comprises a metallic cover 1, preferably cast in aluminum or other corrosion resistant metal, having integral therewith a neck portion 2 terminating in a round cross sectional internally threaded adapted 3 to which an ordinary garden hose, not shown, may be attached.

By reference to Fig. 2 it will be seen that the reservoir 4 is of hollow cylindrical configuration, likewise preferably cast of aluminum, and is provided with an integral radially extending flange 5 for the purpose of stabilizing the device when set on an irregular surface. The reservoir 4 may have its interior space filled, or partially so, with a water soluble chemical 6 before the lawn spraying operation is commenced. A resilient ring gasket 7 is positioned in an annular groove 8 in the cover in concentric relation with wall of the reservoir and interposed between cover 1 and reservoir 4, see Fig. 2, for the purpose of establishing a pressure tight seal.

The interior of the cover is provided with bosses or extension 11 having a threaded opening 10 extending to the chamber 24. Directly above the opening 10, an outlet orifice 31 is provided in the top wall of the chamber 24. Cover 1 is firmly secured to reservoir 4 through engagement of the threads in opening 10 with the threaded upper end of the solute conveying tube 12, preferably of brass. Tube 12 is in turn firmly anchored at the bottom of reservoir interior 6 in an upward central protruberance 13 cast into the reservoir. The tube may have its end which resides in protruberance 13 knurled and die cast into position or it may be screwed therein, the choice being within the purview of a skilled artisan. Although the ring gasket 7 is not shown in compressed relation with the top margin of the wall of reservoir 4, it should be clear from the foregoing that cover 1 may be manually turned into watertight relationship with reservoir 4.

Referring to Fig. 2 it will be apparent how the chemical solute 8 from reservoir interior 6 is educted for admixture with the main stream of water derived from tapered inlet passageway 20, in the cover. This is accomplished by providing tube 12 with a plurality of small apertures 14 and 14a which connect reservoir interior 6 with the bore 15 of the tube. The pairs of apertures 14 and 14a, respectively, are formed by drilling tube 12 diametrically at two longitudinally spaced points to the end that the tubes cross sectional area is not severely reduced at any place, its torsional strength is maintained and a somewhat better aspirating action results. The bore 15 of tube 12 is in substantial axial registration with the bore of the short nozzle 21.

Nozzle 21 is exteriorly threaded for registry with a continuation of the same thread 11 by which cover extension 11 is connected with tube 12. Note that nozzle 21 terminates in a tip 22 having a chamfered margin 23 provided with substantially radial V-grooves or serrations for the purpose of enhancing its hydrodynamic properties. As indicated in Fig. 2, orifice 31 in the upper wall of the chamber 24 is co-axial with the nozzle 21 and spaced therefrom for discharging into free space above the nozzle the solute 8 educted from reservoir chamber 6 through the passageway indicated in the last two paragraphs.

By reference to Fig. 3 in conjunction with Fig. 2 it will be observed that nozzle 21 projects into a cored out mixing chamber 24 having a scroll conformation and directly communicating with tapered inlet passage 20. The relationship of mixing chamber 24 and inlet 22 is such that water flows from the latter tangentially into the former, thus creating a rapidly swirling mass of water having a vortex in the zone of nozzle tip 22.

Pressure developed by the centrifugal action of the water within mixing chamber 24 insures that water delivered from inlet passage 22 will be ejected at very high velocity from discharge orifice 31. Since the hydraulic system embodied by the invention is a closed one, where
the velocity of flow is high due to a constriction such
5 in orifice 31 the pressure is correspondingly low in accord-
ance with well established hydrodynamic principles. It
follows then that the low pressure zone directly above
nozzle tip 22 has the effect of causing the solute to flow
upwardly in tube bore 15, out of nozzle 21 and into the
gyrating stream emitted from orifice 31.

Noted in Fig. 2 that jet or inlet hole 26 is directed an-
gularly downward toward the bottom of the reservoir and
in Fig. 3 tangentially relative to cylindrical path disposed
between the tube 12 and wall of the reservoir 4 so that it
serves to agitate and gyrate the mass of solution remain-
ing in reservoir 6. After prolonged use the entire solute
chemical will be dispersed in a circular pattern on the
surrounding vegetation and only pure water will emenate
from orifice 31. This is, of course, advantageous because
it is highly desirable that potent chemical fertilizer solu-
tions be copiously sprinkled after their distribution in
order that burning of tender plants be avoided.

Another important characteristic of the novel water
spray device is its flow intensity adjustment feature. This
results from nozzle 21 being screw mounted in thread 10.
By merely inserting a small screw driver therein through
orifice 31 or through the bottom when cover 1 is removed,
nozzle 21 may be advanced or retracted with respect to the
orifice. Hence, a very low quantity fine spray occurs when
nozzle 21 nears orifice 31, and conversely, a coarse spray occurs when the nozzle is screwed inwardly. By advancing tip 22 of nozzle 21 into orifice 31 the outflow of water from the orifice may be substantially stopped.

From the foregoing description taken in conjunction with the accompanying drawing it is evident that a very facile means has been described for distributing chemical compounds through the agency of a water vehicle. More-
over, it should be apparent that the device may be con-
vveniently released without detachment from the water
supply hose and that it presents a neat streamlined ap-
pearance by reason of the absence of any movable parts
and its polished aluminum body. In addition, the device
may be completely disassembled, cleaned and utilized by those endowed with a bare minimum of mechanical skill.

Although only a preferred form of the invention has
been described it is realized that such description will
suggest alternative embodiments to those skilled in the
art but it is intended that the scope of the invention be
limited only by the claims which follow.

It is claimed:

1. A combined water spray and chemical dispensing
device, comprising in combination a container, a tube
within said container secured to and extending from the
bottom thereof, said tube being threaded at its end remote
from said bottom and having an aperture intermediate its
ends placing the interior of said tube and said container
in communication with each other; a cover for said con-
tainer having a scroll shaped mixing chamber, a water
inlet passage tangential to said chamber, and a jet ap-
ture extending from the inlet passage to the interior of
said container at an angle toward said tube but tangential
to a circular path about said tube, opposite walls of
said mixing chamber having an orifice and an aperture,
respectively, both coaxial with said tube, the aperture in
the wall of said chamber adjacent said container being
threadedly engaged with said tube and nozzle threadedly
engaging said aperture in said wall coaxially with said
tube and adjustable relative to the orifice in the wall of
said mixing chamber more remote from said container.

2. A combined water spray and chemical dispensing
device, comprising in combination a container, a tube
within said container secured to and extending from the
bottom thereof, said tube being threaded at its end remote
from said bottom and having an aperture intermediate
its ends placing the interior of said container and said
tube in communication with each other; a cover for said
container having a scroll shaped mixing chamber, a water
inlet passage tangential to said chamber and a jet aperture
extending from the inlet passage to the interior of said
container at an angle toward said tube but tangential to
a circular path about said tube, opposite walls of said
cover adjacent said container being threadedly
engaged with said tube, and a nozzle threadedly engaging
said aperture in said wall coaxially with said tube and
extending into said mixing chamber, said nozzle having
a discharge opening in aligned proximity with said orifice
and being spatially adjustable relative thereto through the
medium of its screw thread, whereby the quantity of fluid
discharge from said nozzle may be proportioned with
respect to the total outflow from said orifice.

3. A combined water spray and chemical dispensing
device according to claim 2 wherein the nozzle is char-
acterized by having a cylindrical tip portion of substantially the same diameter as said orifice and a chamfered margin thereon,
the nozzle tip being advanceable and retractable into and
away from said orifice.

4. A combined water spray and chemical dispensing
device according to claim 2 wherein the nozzle has a
cylindrical tip portion of substantially the same diameter
as said orifice and a chamfered margin thereon provided
with radially disposed grooves.

5. A combined water spray and chemical dispensing
device, comprising in combination a container, a cover
engaged with an axially enclosing said container, said
cover having a mixing chamber, a water inlet passage
composed therewith and a jet aperture extending from
the inlet passage to the interior of said container at an
acute angle with respect to bottom thereof but tangential
to the interior periphery of said container, opposite walls
of said mixing chamber having an orifice and a threaded
aperture, respectively, a tube engaged with said threaded
aperture and extending into the interior of said container,
said tube having an aperture placing the interior of said
container in communication with the interior of said
tube, a nozzle threadedly engaged with said threaded aperture
 coaxially with said tube and extending into said mixing
chamber in coaxial proximity with said orifice, said nozzle
being advanceable and retractable on its screw thread with
respect to said orifice, whereby the proportion of fluid
deluted from said container may be varied with respect
to the total quantity of fluid discharged from said orifice.

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